

Serial No.: 10/155,113
Am dt. Dated: September 30, 2004
Reply to Office Action of July 2, 2004

Amendments to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of claims:

1 (currently amended): A paper feeder of an image forming apparatus having an image forming unit to form an image on a printing paper, comprising:

a plurality of first, a second, and a third paper feeding paths along which a printing paper is fed;

a main conveyance path disposed between an image forming unit and the first, second, and third paper feeding paths; and

a main feed roller along which to convey the printing paper is conveyed from the first, second, third paper feeding paths to the image forming unit of the image forming apparatus through the main conveyance path,

wherein a plurality of the first, second, and third paper feeding paths are disposed along an outer circumference of the main feed roller.

2 (currently amended): The paper feeder of claim 1, further comprising:

a connecting conveyance path formed between the main conveyance path and the outer circumference of the main feed roller to guide the printing paper, which is conveyed from the first, second, and third paper feeding paths along the outer circumference of the main feed roller, to the main conveyance path,

wherein the first, second, and third paper feeding paths are confluent along a the connecting conveyance path by the main feed roller, and the connecting conveyance path is connected to a-the main conveyance path which guides the printing paper to the image forming unit of the image forming apparatus.

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3 (currently amended): The paper feeder of claim 2, further comprising:
a sub feed roller which is rotatably disposed on the connecting conveyance path between the main feed roller and the main conveyance path to feed the printing paper, which is conveyed by the main feed roller along the connecting conveyance path, to the image forming unit through the main conveyance path.

4 (original): The paper feeder of claim 3, wherein the sub feed roller adjusts and aligns a position of the printing paper which is conveyed along the connecting conveyance path.

5 (original): The paper feeder of claim 4, further comprising:
a paper sensor disposed on the connecting conveyance path and between the main feed roller and the sub feed roller to determine whether the printing paper being conveyed is a transparent material.

7.6 (currently amended): The paper feeder of claim 4-3, further comprising:
at least one-a pinch roller rotating in tight contact to assist the conveyance of the printing paper with an-the outer circumference of the main-sub feed roller, and disposed at an exit part of the paper feeding paths.

6.7 (currently amended): The paper feeder of claim 31, further comprising:
a first pinch roller assisting the conveyance of the printing paper by rotating in tight contact with an-disposed in a first exit part of the first paper feeding path to feed the printing paper with the outer circumference of the sub-main feed roller; and
a second pinch roller disposed at second and third exit parts of the second and third paper feeding paths to feed the printing paper with the outer circumference of the main feed roller.

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8 (currently amended): The paper feeder of claim 1, wherein the first paper feeding paths-path comprisecomprises:

a cassette conveyance path to guide the printing paper fed from at least two paper feeding cassettes to a first portion of the outer circumference of the main feed roller.

9 (currently amended): The paper feeder of claim 8, wherein the second paper feeding paths-path further comprisecomprises:

a tray conveyance path to guide the printing paper fed from a manual paper feeding tray to a second portion of the outer circumference of the main feed roller.

10 (currently amended): The paper feeder of claim 89, wherein the third paper feeding paths-path further comprisecomprises:

a return conveyance path along which the printing paper is returned to a third portion of the outer circumference of the main feed roller, to provide double-sided printing.

11 (currently amended): The paper feeder of claim 1, wherein:

the first paper feeding paths-path further comprise:comprises a first and a second sub-paths having a first exit part disposed on a first portion of the outer circumference of the main feed roller to guide the printing paper fed from a first and a second paper feeding cassettes to the first portion of the outer circumference of the main feed roller, respectively;

the second paper feeding path comprises a tray conveyance path having a second exit part disposed on a second portion of the outer circumference of the main feed roller to guide the printing paper which is fed from a manual paper feeding tray to the second portion of the outer circumference of the main feed roller; and

the third paper feeding path comprises a return conveyance path having the third exit part disposed on a third portion of the outer circumference of the main feed roller to guide the

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printing paper fed from a manual paper feeding tray to the third portion of the outer circumference of the main feed roller to provide double-sided printing.

12 (currently amended): The paper feeder of claim 1, wherein the first, second, and third paper feeding paths further comprise:

a first, a second, and a third exits a returning conveyance path along which the printing paper is returned to provide double-sided printing disposed on a first, a second, and a third portion of the outer circumference of the main feed roller, respectively.

13 (currently amended): A paper feeder of an image forming apparatus having an image forming unit to form an image on a printing paper, comprising:

a main feed roller conveying a printing paper to the-an image forming unit of the-an image forming apparatus through a main conveyance path;

a connecting conveyance path connected with between a-the main conveyance path inside a body of the image forming apparatus and the main feed roller to convey the printing paper from the main feed roller to the main conveyance path;

a plurality of paper feeding paths disposed along an outer circumference of the main feed roller, and being confluent along the connecting conveyance path by the main feed roller;

a sub feed roller rotatably disposed on the connecting conveyance path to adjust and align a position of the printing paper which passes along the connecting conveyance path; and

first, second and third pinch rollers being in tight contact with outer circumferences of the main feed roller and the sub feed roller to assist the conveyance of the printing paper,

wherein the paper feeding paths comprise,

first and second paper feeding paths disposed on first and second portions of the outer circumference of the main feed roller to feed along which the printing paper from two-first and second paper feeding cassettes are fed to the first and second portions of the outer circumference of the main feed roller,

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a third paper feeding path disposed on a third portion of the outer circumference of the main feed roller to feed along which the printing paper from a manual paper feeding tray is fed to the third portion of the outer circumference of the main feed roller, and

a fourth paper feeding path disposed on a fourth portion of the outer circumference of the main feed roller to feed along which the printing paper inverted is returned from a return path to the fourth portion of the outer circumference of the main feed roller to provide double-sided printing.

14 (currently amended): An image forming apparatus comprising:
an image forming unit forming-to form a desired image on a printing paper;
a main conveyance path guiding-to guide the printing paper to the image forming unit;
a paper feeding unit comprising at least one paper feeding cassette and a paper feeding tray each storing a plurality of printing paper; and
a paper feeder conveying-to convey the printing paper toward the main conveyance path,
wherein the paper feeder comprises,
a plurality of at least three paper feeding paths along which the printing paper fed from the paper feeding unit is guided, and
a main feed roller conveying-to convey the printing paper from the at least three paper feeding paths to the image forming unit through the main conveyance path, the at least three paper feeding paths disposed along at least three portions of an outer circumference of the main feed roller.

15 (currently amended): The image forming apparatus of claim 14, wherein the at least three paper feeding paths are confluent along a connecting conveyance path by the main feed roller, and the connecting conveyance path is connected with the main conveyance path.

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16 (currently amended): The image forming apparatus of claim 14 15, wherein the paper feeder further comprises:

a sub feed roller rotatably disposed on the connecting conveyance path to adjust and align a position of the printing paper which passes along the connecting conveyance path.

17 (original): The image forming apparatus of claim 16, wherein the paper feeder further comprises:

a paper sensor disposed on the connecting conveyance path and between the main feed roller and the sub feed roller to determine whether the printing paper being conveyed is transparent.

18 (currently amended): The image forming apparatus of claim 14 16, further comprising:

a pinch roller rotating to assist the conveyance of the printing paper by rotating in tight contact with an outer circumference of the main sub feed roller, and disposed at an exit part of the paper feeding paths.

19 (currently amended): The image forming apparatus of claim 18 14, further comprising:

a pinch roller assisting to rotate the conveyance of the printing paper by rotating in tight contact with an the outer circumference of the sub main feed roller to feed the printing paper from the at least three paper feeding paths to the image forming unit through the main conveyance path, and disposed at an exit part of one of the at least three paper feeding paths.

20 (currently amended): The image forming apparatus of claim 14, wherein the three portions comprise first, second, and third portions disposed to be spaced-apart from one

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another along the outer circumference of the main feed roller, the at least three paper feeding paths comprise:

a cassette conveyance path to guide the printing paper fed from at least one paper feeding cassette to the first portion of the outer circumference of the main feed roller.

21 (currently amended): The image forming apparatus of claim 20, wherein the at least three paper feeding paths further comprise:

a tray conveyance path to guide the printing paper fed from a manual paper feeding tray to the second portion of the outer circumference of the main feed roller, the second portion disposed between the first portion and the third portion.

22 (currently amended): The image forming apparatus of claim 20, wherein the at least three paper feeding paths further comprise:

a return conveyance path along which to guide the printing paper is returned from a return path to the third portion of the outer circumference of the main feed roller to provide double-sided printing.

23 (currently amended): The image forming apparatus of claim 14, wherein the three portions comprise first, second, and third portions disposed to be spaced-apart from one another along the outer circumference of the main feed roller in order, and the at least three paper feeding paths further comprise:

a tray conveyance path to guide the printing paper fed from a manual paper feeding tray to the second portion of the outer circumference of the main feed roller.

24 (currently amended): The image forming apparatus of claim 14, wherein the at least three paper feeding paths further comprise:

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a cassette conveyance path to guide the printing paper fed from at least one paper feeding cassette to the outer circumference of the main feed roller;

a tray conveyance path to guide the printing paper fed from a manual paper feeding tray to the outer circumference of the main feed roller; and

a returning conveyance path along which the printing paper is returned to the outer circumference of the main feed roller to provide double-sided printing.